

Furniture Design & Manufacturing

Levels:	Grades 10-12
Units of Credit:	1.0
CIP Code:	48.0702
Prerequisite:	Woodworking

CORE STANDARDS, OBJECTIVES, AND INDICATORS

STANDARD 480702-01	Students will be able to understand the cabinetmaking industry.
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OBJECTIVES

480702-01 <u>01</u>	Identify career opportunities in cabinetmaking/millwork manufacturing.
480702-01 <u>02</u>	Identify career opportunities in related millwork industries.

STANDARD 480702-02	Students will be able to understand the design, planning and estimation process.
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OBJECTIVES

480702-02 <u>01</u>	Identify elements and principles of design as they apply to cabinetmaking/millwork manufacturing.
480702-02 <u>02</u>	Draw the necessary views of a selected project.
480702-02 <u>03</u>	Create a material list for the selected project and determine the project cost.
480702-02 <u>04</u>	Create a procedure list for construction of a cabinet.
480702-02 <u>05</u>	Extract pertinent cabinet information and specifications from blueprints and specifications.
480702-02 <u>06</u>	Identify furniture standards relating to tables, seating, bookshelves, and shelving.

**STANDARD
480702-03** **Students will be able to understand and demonstrate safe practices.**

OBJECTIVES

- 480702-0301 Demonstrate the ability to work safely in a wood shop following general safety rules.
- 480702-0302 Demonstrate the safe use of woodworking tools and machines.
- 480702-0303 Demonstrate how to handle and store materials according to MSDS sheets.
- 480702-0304 Pass a written safety test with a score of 100 percent.

**STANDARD
480702-04** **Students will be able to understand and demonstrate the safe use of hand tools.**

OBJECTIVES

- 480702-0401 Describe the purpose and demonstrate the proper use of striking tools.
- 480702-0402 Describe the purpose and demonstrate the proper use of measuring and layout tools.
- 480702-0403 Describe the purpose and demonstrate the proper use of sawing tools.
- 480702-0404 Describe the purpose and demonstrate the proper use of edge-cutting tools.
- Sharpen selected edge-cutting tools.
- 480702-0405 Describe the purpose and demonstrate the proper use of fastening tools.

**STANDARD
480702-05** **Students will be able to understand and demonstrate the safe use of portable power tools.**

OBJECTIVES

- 480702-0501 Describe the purpose and demonstrate the proper use of routers.
- 480702-0502 Describe the purpose and demonstrate the proper use of reciprocal or circular saws.
- 480702-0503 Describe the purpose and demonstrate the proper use of a biscuit jointer.
- 480702-0504 Describe the purpose and demonstrate the proper use of a power plane.
- 480702-0505 Describe the purpose and demonstrate the proper use of power drills and drivers.
- 480702-0506 Describe the purpose and demonstrate the proper use of pneumatic tools.

**STANDARD
480702-06** **Students will be able to understand and demonstrate the safe use of power machines.**

OBJECTIVES

480702-0601

Describe the purpose and demonstrate the proper use of cutting machines.

- Table Saw – change blade, setup dado blade, cut a cove, cut a bevel, rip, cross cut, miter.
- Scroll Saw – cut arcs, circles, change blade, and set tension.
- Radial Arm Saw – change blade, adjust for squarness.
- Panel Saw – change blade, cut horizontal and vertical.
- Band Saw – cut arcs and circles

480702-0602

Describe the purpose and demonstrate the proper use of edge and surfacing machines.

- Jointer – facing and edging.
- Surfacer – surface.

480702-0603

Describe the purpose and demonstrate the proper use of shaping machines.

- Shaper – cut with a fence or collar.
- Router table

480702-0604

Describe the purpose and demonstrate the proper use of boring machines.

- Drill Press – setup, adjust, and bore.

480702-0605

Describe the purpose and demonstrate the proper use sanding machines.

- Spindle Sander
- Disc Sander
- Belt/Drum Sander

STANDARD 480702-07

Students will be able to understand wood components and characteristics.

OBJECTIVES

480702-0701

Describe the anatomy of a tree and the significance that it has in cabinet construction.

- Describe and know how to deal with natural and manmade defects.

480702-0702

Demonstrate a knowledge of the seasoning and drying of lumber.

480702-0703

Distinguish between softwoods and hardwoods.

480702-0704

Identify the difference between solid wood and manmade goods and describe the use of each.

480702-0705

Identify wood species and list the species most suited for furniture construction – alder, cherry, oak, walnut, maple, poplar, pine, mahogany, cedar.

480702-0706

Identify the different grades of lumber, panel, and sheet goods – FAS, Select, #1COM.

480702-0707

Properly store material.

**STANDARD
480702-08**

Students will be able to understand and demonstrate basic math and measuring concepts.

OBJECTIVES

- 480702-0801 Add two- and three-digit numbers.
- 480702-0802 Subtract two-, three-, and four-digit numbers.
- 480702-0803 Solve two-digit divisor numbers.
- 480702-0804 Multiply a two-digit numbers.
- 480702-0805 Identify the parts of a fraction.
- 480702-0806 Add and subtract fractions and mixed numbers.
- 480702-0807 Multiply and divide fractions and mixed numbers.
- 480702-0808 Convert fractions to decimals.
- 480702-0809 Reduce fractions.
- 480702-0810 Add decimal numbers.
- 480702-0811 Subtract decimal numbers.
- 480702-0812 Multiply decimal numbers.
- 480702-0813 Divide a whole number by a decimal.
- 480702-0814 Calculate board feet and square feet.
- 480702-0815 Add and subtract linear measurement.
- 480702-0816 Add feet and inches.
- 480702-0817 Read and measure with a tape using sixteenths (1/16).

**STANDARD
480702-09**

Students will be able to understand and demonstrate the use of fasteners, adhesives, and abrasives.

OBJECTIVES

- 480702-0901 Identify the various fasteners and demonstrate the application of each in cabinetmaking – staples, nails, screws, pins, bolts.
- 480702-0902 Identify the different adhesives and preferred use of each.
- 480702-0903 Identify abrasive types – garnet, aluminum oxide, silicon carbide; select and correctly use each specified grit size.
- 480702-0904 Identify the different types of clamps – Bar, “C”, Spring, Band, and Handscrew.

**STANDARD
480702-10**

Students will be able to understand and demonstrate the use of joinery.

OBJECTIVES

- 480702-1001 Identify the basic wood joints used in cabinetmaking/millwork.
 - Butt, miter, rabbet, dado, spline, mortise and tenon, dovetail, groove (plough), lap, pocket, dowel, biscuit.
- 480702-1002 Construct the basic wood joints used in cabinetmaking/millwork.

STANDARD
480702-11 **Students will be able to understand and demonstrate the use of cabinet components and hardware.**

OBJECTIVES

- 480702-1101 Identify the cabinet components of a face frame and cabinet box.
▪ Stile, rail, mullion, side, skin, base, shelf, web frame, kicker, drawer, runner/glide, toe kick, back.
- 480702-1102 Describe the concept of a European (frameless) cabinet system and the advantages and disadvantages of that system.
- 480702-1103 Identify the door options in cabinetmaking.
▪ Flush, overlay, lip, tabour.
- 480702-1104 Identify the components of a drawer.
- 480702-1105 Identify and properly install common cabinet/furniture hardware.
▪ Hinges, drawer guides, pulls, knobs, shelf supports.
- 480702-1106 Assemble a project with the proper adhesive and fasteners.
- 480702-1107 Layout and construct various common types of cabinet doors.
- 480702-1108 Cut out and construct various common types of drawers.
- 480702-1109 Install door and drawer.
- 480702-1110 Identify basic construction methods.
▪ Frame and panel, casework construction, post and rail.

STANDARD
480702-12 **The student will be able to understand and demonstrate finishing techniques.**

OBJECTIVES

- 480702-1201 Properly prepare a surface for Finishing
- 480702-1202 Properly apply stain, penetrating oil, and/or a clear finish.

PROFESSIONAL DEVELOPMENT

STANDARD
480702-13 **The student will understand the need for professional development.**

OBJECTIVES

- 480702-1301 Complete a personal inventory.
- 480702-1302 Set and meet goals.
- 480702-1303 Be self-motivated.
- 480702-1304 Know how to make decisions.
- 480702-1305 Know how to manage time.
- 480702-1306 Organize personal belongings and lab equipment.
- 480702-1307 Learn to communicate verbally.
- 480702-1308 Write effective communications.
- 480702-1309 Establish a personal reading program.
- 480702-1310 Develop effective work skills and attitudes.

- 480702-1311* Master a working knowledge of SkillsUSA.
- State the SkillsUSA motto.
 - State the SkillsUSA creed.
 - Learn the SkillsUSA colors.
 - Describe the official SkillsUSA dress.
 - Describe the procedure for becoming a SkillsUSA officer.

STANDARD **The student will understand the need for leadership skills.**
480702-14

OBJECTIVES

- 480702-1401 Serve on a committee.
480702-1402 Prepare an agenda.
480702-1403 Assist in planning a meeting.
480702-1404 Review basic parliamentary procedure.
 - Make a main motion.480702-1405 Participate in a school project.
480702-1406 Attend a community meeting.
480702-1407 Practice effective speaking.
480702-1408 Present a three- to five-minute talk.
480702-1409 Implement a leadership project.
480702-1410* Master a working knowledge of SkillsUSA.
 - Describe the meaning of the SkillsUSA emblem.
 - State the SkillsUSA pledge.
 - Describe the duties of a SkillsUSA officer.

STANDARD **The student will understand the need for career planning.**
480702-15

OBJECTIVES

- 480702-1501 Define your future occupation.
480702-1502 Survey employment opportunities.
480702-1503 Report on a trade journal article.
480702-1504 Explore opportunities for advanced training.
480702-1505 Conduct a worker interview.
480702-1506 Contact a professional association.
480702-1507 Explore entrepreneurship opportunities.
480702-1508 Give a talk about your career.
480702-1509 Review career goals.

STANDARD **The student will understand the importance of employability and work habits.**
480702-16

OBJECTIVES

- 480702-1601 Develop a list of work standards to follow at school and on the job.

- 480702-1602 Evaluate your personal ethics.
 - Evaluate your personal ethics against acceptable workplace ethics.
- 480702-1603 Build a job search network.
- 480702-1604 Find job leads.
- 480702-1605 Write a resume.
- 480702-1606 Create a job portfolio.
- 480702-1607 Complete a job application.
- 480702-1608 Write a business letter and memo.
- 480702-1609 Participate in an actual or simulated job interview.

* SkillsUSA PDP requirements - optional but recommended